



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No. 10/023,373  
(Attorney Docket No. GP-301381)

Filed December 17, 2001

Robert L. Vitale  
Kevin g. Kolpasky

Group 3618

ELECTRONIC VEHICLE REGISTRATION  
AND LICENSE PLATE

Examiner Tam D. Tran

AFFIDAVIT UNDER 37 CFR 1.131

Commissioner for Patents  
P O Box 1450  
Alexandria VA 22313-1450

Robert L. Vital, being duly sworn, deposes and says:

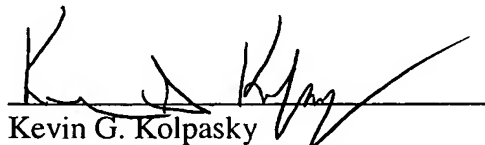
Kevin G. Kolpasky, being duly sworn, deposes and says:

1. I am an inventor of claims 1-21 of the patent application identified above and an inventor of the subject matter described and claimed therein.

2. Prior to October 1, 2001, having earlier conceived of the idea for the claimed invention "Electronic Vehicle Registration And License Plate," and with due diligence, I reduced the invention in the United States as evidenced by the attached invention disclosure form and documentation. The dates have been redacted from the invention disclosure and documentation.

3. That all statements made above of my own knowledge are true, that all statements made above on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under title 18 United States Code, Section 1001 and may jeopardize the validity of the application or any patent issuing thereon.

  
Robert L. Vitale

  
Kevin G. Kolpasky

Subscribed and sworn to before me this 7 day of December, ~~2003~~ 2004 / erb

Sharon A. Borowicz  
Notary Public

General Motors Corporation  
Legal Staff  
300 Renaissance Center  
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PO Box 300  
Detroit MI 48265-3000

SHARON A. BOROWICZ  
NOTARY PUBLIC, OAKLAND COUNTY, MICHIGAN  
MY COMMISSION EXPIRES MAY 15, 2007

Attachment



GENERAL MOTORS  
CORPORATION

ELECTRICAL

File No.

GP. 301381



# RECORD OF INVENTION

This Record of Invention must be completed with sufficient detail so that your invention can be understood and evaluated by both your engineering management and by a GM Legal Staff patent attorney. Novelty and competitive significance of your invention will be evaluated based on the information you provide.

Invention Title: Digital Vehicle License Plate Display & Digital Registration

## Inventor #1

Name: Robert L. Vitale Citizen of: USA  
First Name Middle Initial Last Name

Social Security No. 374-56-8174 GM Employee: ☒ Yes ☐ No ☒ Salary ☐ Hourly ☐ Contract

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GM Unit: Design Center / APEX / Design & Technology Fusion GM Phone No. (8)-227-2391 810-947-2391  
Centrex Number (Area Code) + Number

GM Address: 30200 Mound Rd. Mail Code: 480-111-P54 FAX Number: (8)-226-8586  
Centrex Number

Non-GM Employer: \_\_\_\_\_ Phone No. \_\_\_\_\_  
(Area Code) + Number

Non-GM Employer Address: \_\_\_\_\_  
Street City and State Zip Code

## Inventor #2\*

Name: Kevin G Kolpasky Citizen of: United States  
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GM Address: 30200 Mound Road Mail Code: 480-111-P54 FAX Number: (8)-226-8586  
Centrex Number

Non-GM Employer: \_\_\_\_\_ Phone No. \_\_\_\_\_  
(Area Code) + Number

Non-GM Employer Address: \_\_\_\_\_  
Street City and State Zip Code

**RECEIVED**

GENERAL MOTORS CORPORATION

\* If there are more than two (2) inventors for this invention use the template at the end of this form.

**Answer questions 1 - 8, completing all of them to the best of your knowledge.**

1. This invention was first thought of on: \_\_\_\_\_

2. This invention has been or is expected to be disclosed outside GM on: NA

3. This invention has been used or is committed to be used in production on: NA

4. This invention has been offered for sale outside GM on: NA

5. Was this invention made while working on a Government Contract? ☐ Yes ☒ No

If yes, identify the government Contract No. \_\_\_\_\_

6. Identify the product or process in which the invention is incorporated: \_\_\_\_\_

7. List all individuals who can provide information about the making of the invention. This list may include individuals who made the first sketch, description, or tests and individuals who are familiar with the facts relating to the making of the invention.

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8. Each inventor has a legal duty to disclose all information known that is material to patentability of this invention. Such information includes the relevant prior art, which may be in the form of current or past products, equipment, processes, materials, patents, publications, advertisements, displays, and unpublished developments and proposals—whether originated by you, others in GM, competitors, suppliers, customers or others. Such information also includes disclosure of this invention outside GM, sales and offers of products using this invention, use of this invention in production and disputes about who should be considered as an inventor of this invention. To comply with the duty to disclose, list here and attach a copy of all such information, to the extent known.

*None Known*

**Answer question 9 thoroughly.**

9. Describe the invention in sufficient detail so that its nature, operation and usefulness can be understood. (Attach drawings, diagrams and further description, when necessary. Additional guidelines are listed below.) This invention is divided into two parts: The first part is the Display; the second is the Digital registration information storage.

**Part One: Digital Display**

Current vehicle registration required by each state utilizes a stamped plate with alpha/numeric significance based on a numbering sequence. This plate identifies the state and date of registration as well as other vital information of the vehicle. The invention described herein is designed to provide the same information however in digital form. The digital display eliminates the need for a stamped metal license plates, it replaces it with a moldable digital display adaptable to both rear and/or front bumper fascias with no alteration of the fascia itself. This digital display would be comprised of new LED technology enabling any form of digits (Vehicle Number / Exp. Date) or logos (State ID) to be displayed on its surface. The display can be tied into the main bus (CAN network) via a small connector designed into each fascia either as an aftermarket system or built into the fascia as an OEM system. The signal source can be either small copper wire harness or potentially a fiber optic cable, either way the system would derive its information from the main BCM (Body Computer Module). The display would be visible in daylight lighting condition, also in the northern hemisphere where winter snows can block the ability to read license information, the heat generated from the digital license would keep the visual acuity intact. The display would be turned on only when the vehicle is in the running mode, when the vehicle is stopped and turned off so is the display. The local law enforcement could easily read the vehicle information with a handheld scanner off of a bar coded VIN (Vehicle Identification Number) attached to the body of the vehicle and visible in the lower portion of the IP panel through the windshield. The VIN number would be all that is required to identify the vehicle registration information stored on the secretary of states database. The panel will be designed to be extremely thin, it is inserted into the slot much like a digital camera media card is inserted into the camera.

**Part Two: Digital Information Storage**

Currently, vehicle owners carry with them a paper copy of the registration information of the vehicle for which they either own or are driving. This invention would eliminate the need for this paper form by providing the vehicle registration information be encoded onto a smart chip built into the ignition key (FOB currently in use) or in future application a potential smart card the vehicle driver can carry with them. The VIN plate would also incorporate a smart chip carrying identical information as the FOB or Smart Card. This would allow access to the vehicle registration information when the vehicle is parked and turned off. This information along with the current usage of transponder information stored on the key would add another level of security supporting anti-theft measures. The registration would always be with the driver of the vehicle eliminating the potential of forgetting to carry it on the person. There are several scenarios on how the key can be coded; first one occurs at the dealership upon delivery of the vehicle to the owner. The second is when the driver renews his or her plates at the local Secretary of State office they encode the key there, only requiring an yearly date update, the vehicle registration information is only coded once at the dealer or possibly the vehicle factory. The third scenario is the potential to utilize the internet to send the information to the vehicle owner and allow them to code the key at their residence.

**Governmental & Community Benefits**

State Government would also benefit from this system, a major impact on the infrastructure of each state would occur in the reduction and or elimination of the necessity to produce metal license plates for the states residences. This would reduce their overhead and streamline their process.

**Mechanical and Electrical Devices:** Include illustrations assigning reference numbers to the main elements and refer to the reference numbers in a description that explains how the main elements are connected or related and how they operate.

**Electrical Circuits and Controls:** Include circuit diagrams and a functional description.

**Computer Software and Manufacturing or Business Processes:** Include a flowchart or other step-by step overview.

**Chemical Inventions:** Identify all essential materials used, and alternatives therefor, in chemical terms – not tradenames. Identify and quantify all significant variables (e.g. temperature, pressure, concentration, pH etc.) of the process or material specifying operating ranges and the preferred example. Discuss the significance of each variable. Provide a recipe for at least one working example of the invention.

10. What benefits will be realized by using this invention?

11. What is the state of development of this invention?

12. To the extent known, what alternatives exist for accomplishing substantially the same result as this invention?

Rev. 5/00

File Number: \_\_\_\_\_

I hereby assign this invention to General Motors Corporation  
and authorize General Motors Corporation to file an application on my behalf.

  
INVENTOR - SIGNATURE

ROBERT L. VITALE  
(ALSO, PRINT NAME)

DATE

  
INVENTOR - SIGNATURE

KEVIN KOLPAS  
(ALSO, PRINT NAME)

DATE

INVENTOR - SIGNATURE

(ALSO, PRINT NAME)

DATE

This invention was reviewed and understood by me:

  
1st WITNESS - SIGNATURE

JASON TILK  
(ALSO PRINT NAME)

DATE

  
2nd WITNESS - SIGNATURE

Lisa L Buscher  
(ALSO, PRINT NAME)

DATE

# Digital Vehicle License Plate & Digital Registration

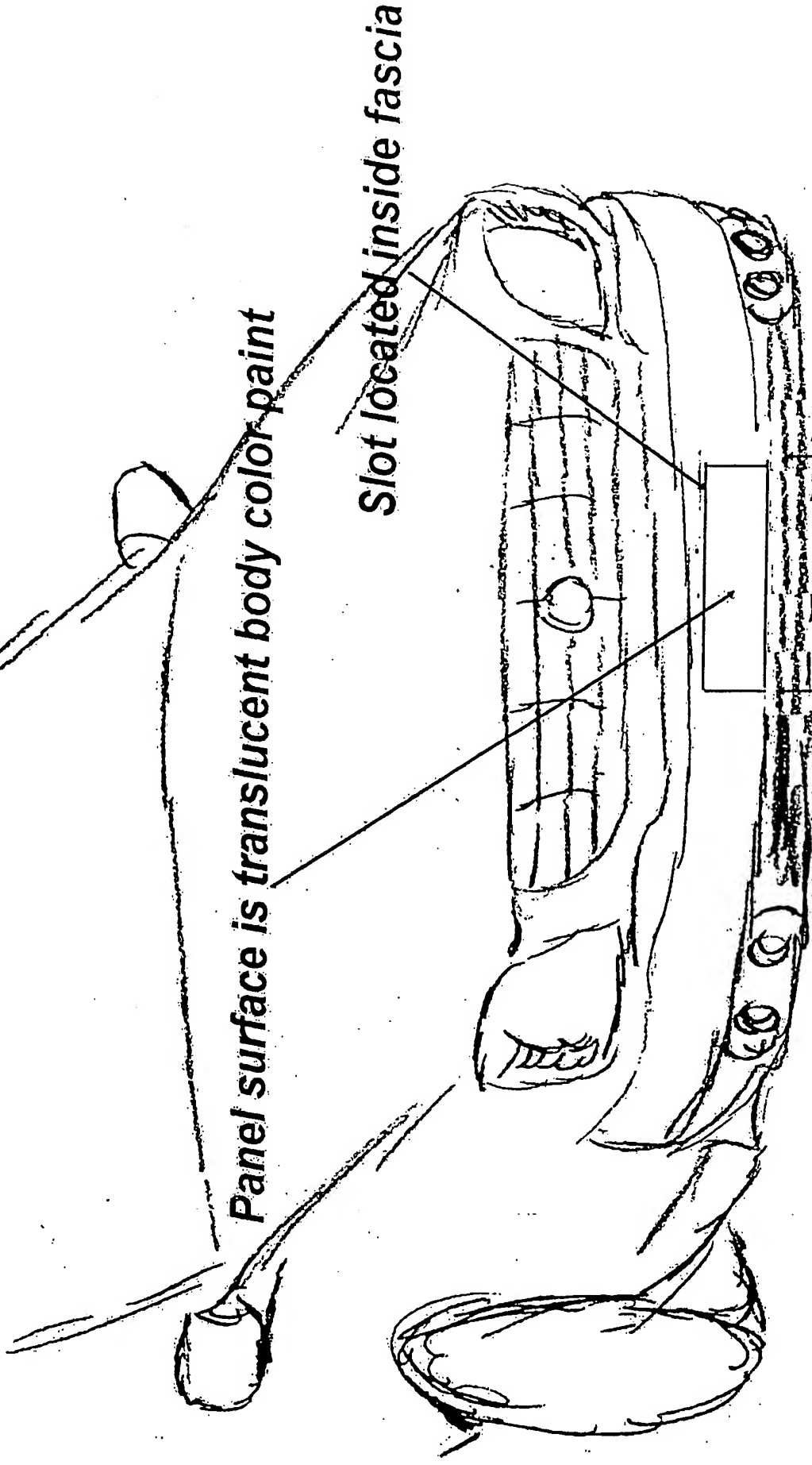
File# GP-GP-301381

Robert Vitale, Kevin G. Kolpasky

- **Digital License Plate**
  - Removes Fascia design constraints
  - Replaces current metal plates with flexible media
  - Replaces stamped information with digital
- **Digital Vehicle Registration / ID**
  - On board registration data is stored in BCM
  - BCM communicates with Key FOB/Smart Card
  - Vehicle registration process is brought into the 21st century through digital information delivery
  - Speeds Secretary of State's registration process



*The Digital Display allows for either front or rear fascia application*



*Panel surface is translucent body color paint*

*Slot located inside fascia*

**Digital Display Panel**

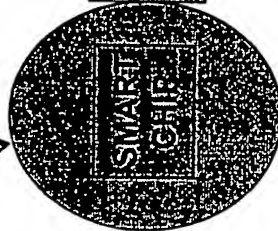
**FZT-876**

*Applicable to front  
or Rear Fascia systems*

# Technology in the CHIP

Complete Vehicle VIN data and Registration information is stored in the Smart Chip

Smart Chip identifies the person, enabling entry and start mode, and any memory settings for radio, HVAC, seats, etc.



KEY FOB

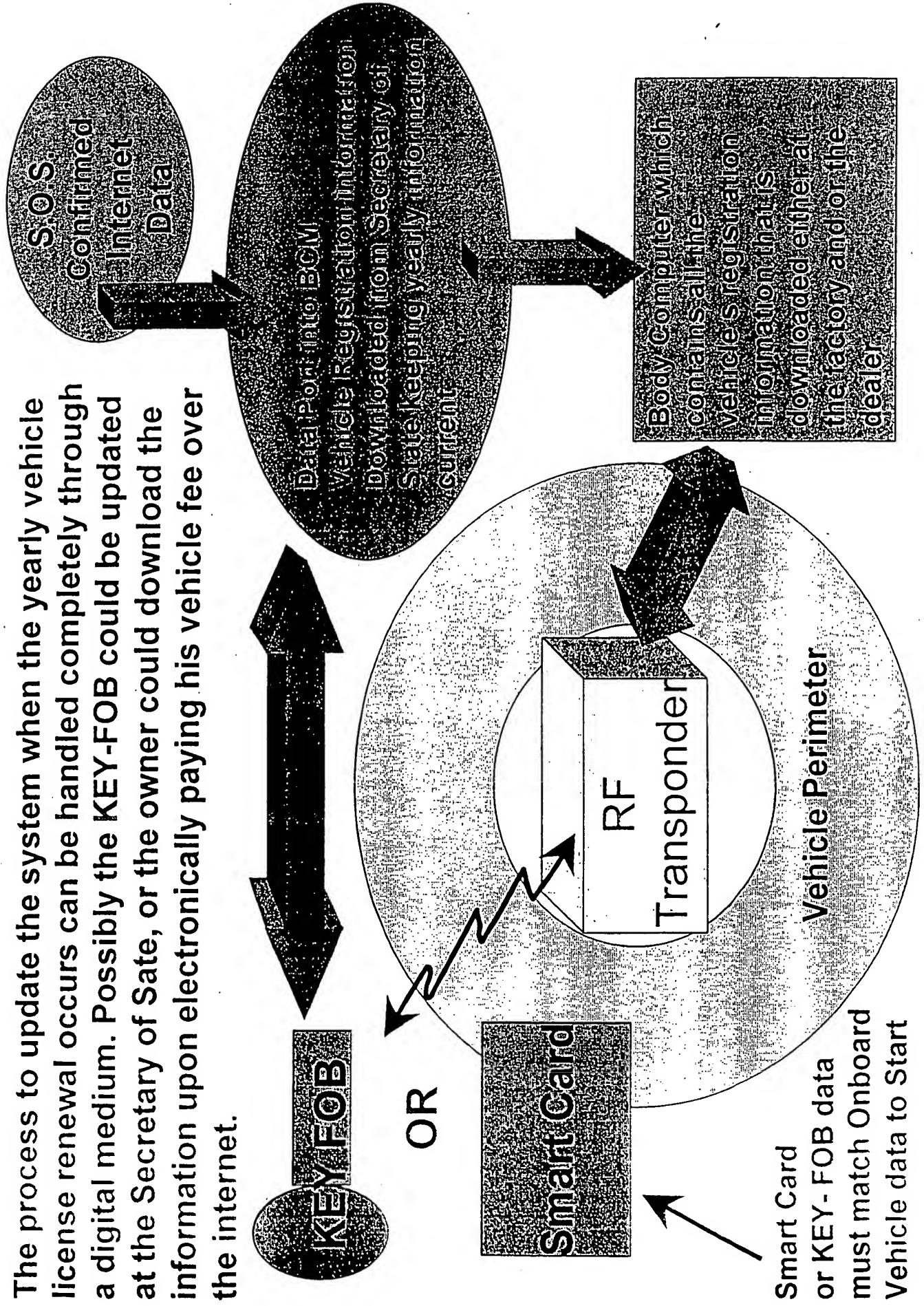
Non-Volatile memory stores information. Small battery is re-charged through key insertion on FOB version

OR

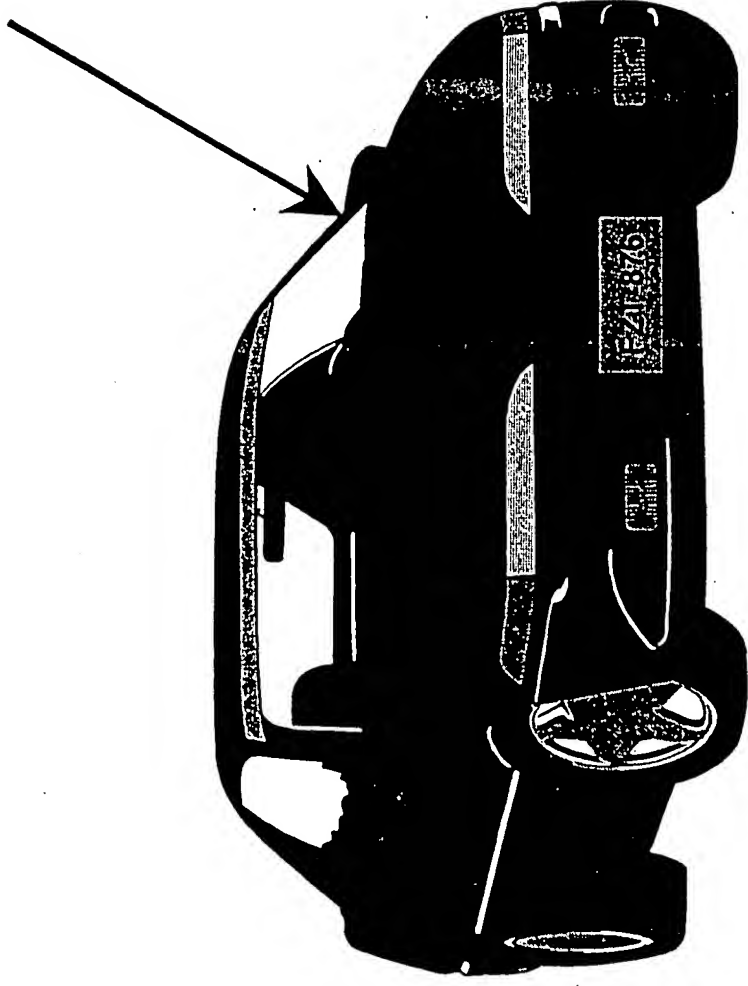
SMART CHIP  
Smart Card

## DVR: Digital Vehicle Registration / ID

The process to update the system when the yearly vehicle license renewal occurs can be handled completely through a digital medium. Possibly the KEY-FOB could be updated at the Secretary of State, or the owner could download the information upon electronically paying his vehicle fee over the internet.



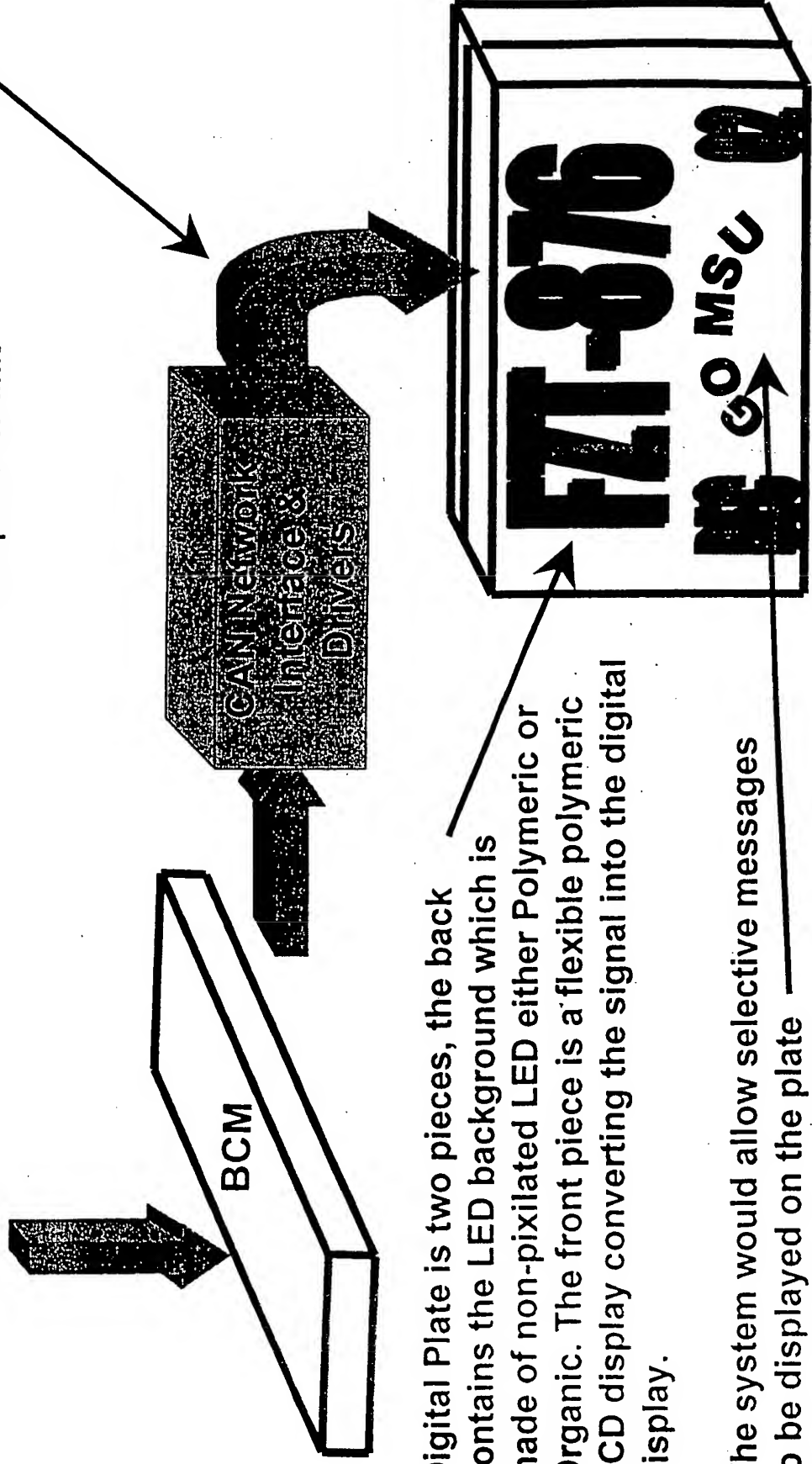
- When vehicle is parked the Digital Plate is turned off
- Law enforcement can ID the vehicle from scanning the VIN tag located on the vehicle, referencing the S.O.S. database can ID the vehicle and its owner



# Digital Vehicle License Plate

Vehicle ID Information initiated at Plant Build  
Upon delivery the Dealer downloads the S.O.S  
data when vehicle is first registered  
Customer can update on yearly renewal

Network can be flat cable design or potentially  
Fiber Optic based, cable delivers both signal  
and power to unit



Digital Plate is two pieces, the back contains the LED background which is made of non-pixelated LED either Polymeric or Organic. The front piece is a flexible polymeric LCD display converting the signal into the digital display.

The system would allow selective messages to be displayed on the plate